

BUCHANAN - 10/830,168  
Attorney Docket: P2004J011

IN THE CLAIMS:

Please amend the claims as follows:

1. (Cancelled).
2. (Currently Amended) A separation system according to Claim 22 + in which the total area of the gaps between the channels of the tier is less than the total area of the tier.
3. (Cancelled).
4. (Currently Amended) A separation system according to claim 22 + in which the tiers are disposed at an angle no more than 10 percent from the horizontal.
5. (Currently Amended) A separation system according to claim 22 + in which each flow deflector is attached to a bottom portion of a channel of the upper tier.
6. (Original) A separation system according to Claim 5 in which each flow deflector is attached at the side of a bottom portion of a channel of the upper tier.
7. (Previously Presented) A separation system for de-entraining liquid particles from an upwardly flowing gaseous stream comprising:
  - a de-entrainment zone of vertically spaced, parallel tiers of elongated, U-shaped, liquid collector channels arrayed transversely to the flow of the gaseous stream,
  - wherein each tier having parallel rows of collector channels which are staggered vertically from the rows in the next adjacent tier to deflect the flow of the gaseous stream from a lower tier through gaps between adjacent rows in an upper tier, to separate

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entrained liquid from the gaseous stream and permit the separated liquid to descend into channels of a lower tier for collection, with a plurality of horizontally-elongated flow deflectors extending parallel to each channel in the region between an upper tier and an adjacent lower tier, in a direction downwards towards a channel of the lower tier,

wherein the channels of the lower tier have foraminous extensions in the region between the upper tier and the lower tier, and the channels of an upper tier have downwardly extending deflectors attached to their bottom portions.

8. (Previously Presented) A separation system for de-entraining liquid particles from an upwardly flowing gaseous stream comprising:

a de-entrainment zone of vertically spaced, parallel tiers of elongated, U-shaped, liquid collector channels arrayed transversely to the flow of the gaseous stream,

wherein each tier having parallel rows of collector channels which are staggered vertically from the rows in the next adjacent tier to deflect the flow of the gaseous stream from a lower tier through gaps between adjacent rows in an upper tier, to separate entrained liquid from the gaseous stream and permit the separated liquid to descend into channels of a lower tier for collection, with a plurality of horizontally-elongated flow deflectors extending parallel to each channel in the region between an upper tier and an adjacent lower tier, in a direction downwards towards a channel of the lower tier,

wherein each flow deflector is attached to a bottom portion of a channel of the upper tier and the channels of an upper tier have foraminous extensions in the region above the upper tier, to which downwardly extending deflectors are attached.

9. (Currently Amended) A separation system according to claim 22 + in which the flow deflectors are attached to the channels of the lower tier.

10. (Cancelled).

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11. (Cancelled).
12. (Currently Amended) The distillation unit of claim 14 ~~11~~ which comprises a plurality of superimposed separators.
13. (Currently Amended) The distillation unit of claim 14 ~~11~~ in which each flow deflector is attached at the side of a bottom portion of a channel of the upper tier.
14. (Previously Presented) A multi-tray distillation unit comprising:
- at least one contact tray for contacting a gaseous stream flowing upwardly in the unit with liquid passing downwardly through the unit; and
  - at least one separator for de-entraining liquid particles from the gaseous stream after passing through liquid on the contact plate, the at least one separator comprising vertically spaced, parallel tiers of elongated, U-shaped, liquid collector channels arrayed transversely to the flow of the gaseous stream,
- wherein each tier having parallel rows of collector channels which are staggered vertically from the rows in the next adjacent tier to deflect the flow of the gaseous stream from a lower tier through gaps between adjacent rows in an upper tier, to separate entrained liquid from the gaseous stream and permit the separated liquid to descend into channels of a lower tier for collection,
- wherein each upper tier channel having at least one rigidly-mounted, horizontally-elongated flow deflector extending downward from the upper tier channel towards a lower tier channel below the deflector,
- wherein the channels of the lower tier have foraminous extensions in the region between the upper tier and the lower tier, and the channels of an upper tier have downwardly extending deflectors attached to their bottom portions.

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15. (Previously Presented) A multi-tray distillation unit comprising:

at least one contact tray for contacting a gaseous stream flowing upwardly in the unit with liquid passing downwardly through the unit; and

at least one separator for de-entraining liquid particles from the gaseous stream after passing through liquid on the contact plate, the at least one separator comprising vertically spaced, parallel tiers of elongated, U-shaped, liquid collector channels arrayed transversely to the flow of the gaseous stream,

wherein each tier having parallel rows of collector channels which are staggered vertically from the rows in the next adjacent tier to deflect the flow of the gaseous stream from a lower tier through gaps between adjacent rows in an upper tier, to separate entrained liquid from the gaseous stream and permit the separated liquid to descend into channels of a lower tier for collection,

wherein each upper tier channel having at least one rigidly-mounted, horizontally-elongated flow deflector extending downward from the upper tier channel towards a lower tier channel below the deflector,

wherein the channels of an upper tier have foraminous extensions in the region above the upper tier, to which downwardly extending deflectors are attached.

16. (Currently Amended) The distillation unit of claim 15 ~~14~~ in which the flow deflectors are attached to the channels of the lower tier.

17. (Currently Amended) The distillation unit of claim 15 ~~14~~ which includes a liquid downcomer into which the channels have outlets for collected, separated liquid and which has an outlet for the collected liquid through a liquid seal onto a contact plate.

18. (Original) The distillation unit of claim 17 in which the liquid downcomer has a liquid outlet at a contact plate below the level of the plate at which the entrainment has taken place.

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19. Cancelled.

20. Cancelled.

21. (Previously Presented) The separation system according to claim 9, wherein the deflector extends at angle to the bottom portion and the sidewall away from the bottom portion.

22. (Currently Amended) A separation system according to claim 1 for de-entraining liquid particles from an upwardly flowing gaseous stream comprising:

a de-entrainment zone of vertically spaced, parallel tiers of elongated, U-shaped, liquid collector channels arrayed transversely to the flow of the gaseous stream,

wherein each of the elongated, U-shaped, liquid collector channels having a bottom portion and a pair of sidewalls extending therefrom,

wherein each tier having parallel rows of collector channels which are staggered vertically from the rows in the next adjacent tier to deflect the flow of the gaseous stream from a lower tier through gaps between adjacent rows in an upper tier, to separate entrained liquid from the gaseous stream and permit the separated liquid to descend into channels of a lower tier for collection, with a plurality of horizontally-elongated flow deflectors extending parallel to each channel in the region between an upper tier and an adjacent lower tier, in a direction downwards towards a channel of the lower tier,

wherein each of the plurality of horizontally-elongated flow deflectors of an upper tier deflects at least a portion of the gaseous stream into a corresponding channel of the lower tier,

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wherein each deflector extends below the bottom portion, wherein each of the elongated, U-shaped, liquid collector channels in the upper tier having a cap deflector interconnecting adjacent channels.

23. (Previously Presented) The separation system according to claim 22, wherein a portion of the cap deflector depends downwardly into one of the channels in the upper tier.

24. (Previously Presented) The separation system according to claim 22, wherein the cap deflector having a foraminous portion.